

CLAIMS

1. Process for increasing the molecular weight of a polyamide via solid-state post-condensation by exposing the polyamide prepolymer in the solid-state at elevated temperature to an inert gas atmosphere, characterized in that the process comprises a step (a) wherein the gas atmosphere to which the polyamide is exposed has a dew temperature  $T_{\text{dew-1}}$ , followed by a step (b) wherein the gas atmosphere to which the polyamide is exposed has a dew temperature  $T_{\text{dew-2}}$ , whereby  $T_{\text{dew-1}}$  is higher than  $T_{\text{dew-2}}$ .
2. Process according to Claim 1, wherein the polyamide is polyamide-6 or polyamide-12.
3. Process according to Claim 1, wherein the polyamide has a melting temperature of at least 260°C.
4. Process according to Claim 3, wherein the polyamide is chosen from the group consisting of polyamide-4.6, copolymers thereof, polyamide-6.6 and copolymers thereof.
5. Process according to any of Claims 1-4, wherein  $T_{\text{dew-1}}$  is at least 10°C higher than  $T_{\text{dew-2}}$ .
6. Process according to any of Claims 1-5, wherein  $T_{\text{dew-2}}$  is at most 20°C.
7. Process according to any of Claims 1-6, wherein  $T_{\text{dew-1}}$  is at least 30°C.
8. Process according to any of Claims 1-7, wherein the gas atmospheres of step (a) and step (b) have a temperature between 20°C and 100°C below the melting temperature of the polyamide polymer.
9. Process according to any of Claims 1-8, wherein the gas atmosphere of step (a) has a temperature  $T_{\text{gas-1}}$  and the gas atmosphere in step (b) has a temperature  $T_{\text{gas-2}}$ , whereby  $T_{\text{gas-1}}$  is at least 10°C higher than  $T_{\text{gas-2}}$ .
10. Process according to any of claims 1-9, wherein the polyamide has an initial-viscosity number  $VN_0$  of at most 100 ml/g.
11. Process according to any of Claims 1-10, wherein at the end of step (a), the polyamide has an intermediate-viscosity corresponding with a viscosity number  $VN_{\text{int}}$  and at the end of step (b) the polyamide polymer has an end-viscosity corresponding with a viscosity number  $VN_{\text{end}}$ , whereby  $VN_{\text{int}}$  is at most 90% of  $VN_{\text{end}}$ , measured according to ISO 307.

12. Process according to any of Claims 1-11, wherein step (b) is started after the polyamide in step (a) has obtained an intermediate-viscosity corresponding with a viscosity number  $VN_{int}$  of at least 70 ml/g, measured according to ISO 307.
- 5 13. Process according to any of Claims 1-12, wherein the polyamide comprises it least one additive chosen from a group comprising fillers, reinforcing agents, flame retardants, colorants and stabilizers.